

5 What is claimed is:

1. An anti-rotational apparatus for preventing rotational movement of a sample tube mounted on a carousel, comprising:

a sample tube having an open proximal end and a closed distal end, the sample tube having an annulus adjacent the proximal end, the annulus being radially outwardly projecting and including an anti-rotational structure; and

a carousel designed for rotation and having openings for carrying a plurality of sample tubes, at least one of the openings including compatible and mating anti-rotational structure for mating with the anti-rotational structure of the sample tube, wherein, the anti-rotational apparatus comprises the combination of the sample tube and the carousel anti-rotational structures.

2. The anti-rotational apparatus of Claim 1, wherein the carousel plurality of openings include anti-rotational structure compatible with sample tube anti-rotational structure.

3. The anti-rotational apparatus of Claim 1, wherein the carousel anti-rotational structure includes a female tooth pattern and the sample tube anti-rotational structure includes a male tooth pattern and wherein the patterns are compatible and lock each of the sample tube and carousel to each other against the forces created by rotational movement of the carousel.

4. The anti-rotational apparatus of Claim 1, wherein the anti-rotational structures of the sample tube and the carousel comprise gear tooth patterns which lock

5 each of the sample tube and carousel to each other against the forces created by rotational movement of the carousel.

5. The anti-rotational apparatus of Claim 1, wherein the sample tube includes unique identifying indicia between the proximal and distal ends, whereby the unique identifying indicia is held in place during rotation movement of the carousel..

10 6. The anti-rotational apparatus of Claim 5, wherein the unique identifying indicia is machine readable.

15 7. The anti-rotational apparatus of Claim 5, wherein the unique identifying indicia comprises a bar code and wherein the carousel is part of an overall diagnostic system which includes a bar code reader and a diagnostic pipette, the bar code reader matching sample tube to the appropriate pipette.

8. The anti-rotational apparatus of Claim 1, wherein the each of the carousel anti-rotational structure and the sample tube anti-rotational structure are made from engineering plastic.

20 9. The anti-rotational apparatus of Claim 1, wherein the tooth patterns include a series of teeth and depressions.

10. The anti-rotational apparatus of Claim 1, wherein the teeth are spaced apart and the space between the teeth is in the range between 0.35 mm and 0.50 mm.

11. The anti-rotational apparatus of Claim 9, wherein the rise from surface at an angle of 60°.

25 12. A diagnostic sample tube for removable connection with a rotatable carousel, comprising:

5 a cylindrical vial having a first closed end and a second open end and an outer surface extending from the first to the second end and an outwardly extending annulus protruding from the outer surface for removable connection with compatible structure on the diagnostic carousel, the annulus having a face facing toward the first end and the face having an anti-rotation apparatus; and

10 a carousel having an outer zone with openings compatible for removably lodging the sample tube, the outer zone having first surface facing the direction of entry of the tube with the carousel, the first surface having a anti-rotation apparatus for mating with the sample tube anti-rotation apparatus,

15 whereby, the combination of the anti-rotation apparatus of the sample tube and carousel prevent rotation of the sample relative to the carousel upon rotation of the carousel.

13. The diagnostic sample tube as set forth in Claim 12, wherein the anti-rotation apparatus includes mating male and female on the anti-rotation apparatus.

14. The diagnostic sample tube as set forth in Claim 13, wherein the sample tube anti-rotation apparatus has male mating teeth and the carousel has compatible female mating teeth.

15. The diagnostic sample tube as set forth in Claim 12, wherein each sample tube in the carousel has a machine readable identifying indicia.

16. The diagnostic sample tube as set forth in Claim 15, wherein upon mating of the anti-rotation apparatus of the corresponding sample tube and carousel, the identifying indicia is locked in proper position to be read by a machine readable device.

5 17. The diagnostic sample tube as set forth in Claim 16, wherein the
identifying indicia comprises a standard bar code and wherein a bar code reader can
read the bar code.

 18. A method of securing a sample tube to a rotatable carousel for preventing
movement of the sample relative to the carousel, the steps comprising:

10 placing a sample tube having anti-rotational structure on a carousel having
compatible anti-rotational structure; and

 mating the anti-rotational structures of the sample tube and the carousel before
rotating the carousel.

15 19. The method of claim 18, wherein the sample tube is slidably placed into the
carousel, the anti-rotational structure not interfering with the slidable placement of the
sample tube.

 20. The method claim 18, wherein the carousel is rotated after the mating of the
anti-rotational structures and wherein the sample tube is slidably removed after rotation.